

REMARKS

Claims 1-39 were examined and reported in the Written Opinion. It is asserted that Claims 1-3, 9-11, 13-16, 19-22, 24-28, 30-35 and 37-39 lack novelty under PCT Article 33(2), and that claims 1-39 lack inventive step under PCT Article 33(3). Claims 1, 9, 14, 20, 26 and 33 are amended to clarify the embodiments of the invention in relation to the prior art asserted in the Written Opinion. New claims 40-43 are added. Claims 1-43 remain. Attached hereto are replacement pages 41-47, which include the amendments to the application as indicated above. The inclusion of the replacement pages that do not involve the above indicated amendments are made since the added text shifted the text as a whole throughout the claims section.

Applicant requests reconsideration of the application in view of the following remarks.

I. PCT Article 33(2)

It is asserted in the Written Opinion that claims 1-3, 9-11, 13-16, 19-22, 24-28, 30-35 and 37-39 lack novelty under PCT Article 33(2), as being anticipated by U.S. Patent No. 6,138,092, issued to Zinser, Jr. et al. ("Zinser"). Applicant respectfully disagrees.

Applicant's amended claim 1 contains the limitations of "[a]n encoder comprising: an epoch locator coupled to a frame assembly, a primary epoch analyzer coupled to the epoch locator, and a secondary epoch analyzer coupled to the primary epoch locator, wherein the encoder compresses a plurality of signals at variable frame rates based on a plurality of prioritized parameters to dynamically reduce signal bandwidth while preserving perceptual signal quality."

Applicant's amended claim 9 contains the limitations of "[a] decoder comprising: a frame disassembly and parameter decoding unit coupled to an excitation generator; a synthesizing filter coupled to the excitation generator; and an output scaling and filtering unit coupled to the synthesizing filter, wherein the decoder decompresses a plurality of compressed signals at variable frame rates

based on a plurality of prioritized parameters to dynamically reduce signal bandwidth while preserving perceptual signal quality.”

Applicant’s claim 14 contains the limitations of “[a] program storage device readable by a machine comprising instructions that cause the machine to: receive a plurality of signals from a first transmission device; encode the plurality of signals in a compressed format; and transmit the plurality of signals in a compressed format through a transmission medium at variable frame rates based on a plurality of prioritized parameters to dynamically reduce signal bandwidth while preserving perceptual quality of the signals.”

Applicant’s claim 20 contains the limitations of “[a] program storage device readable by a machine comprising instructions that cause the machine to: receive the plurality of signals in a compressed format through a transmission medium at variable frame rates based on a plurality of prioritized parameters to dynamically reduce signal bandwidth while preserving perceptual quality of the signals; decode the plurality of compressed signals; and transmit the decoded signals to a first receiving device.”

Applicant’s claim 26 contains the limitations of “[a] method comprising: receiving a plurality of signals from a transmission device; encoding the plurality of signals in a compressed format; and transmitting the plurality of signals in a compressed format through a transmission medium at variable frame rates based on a plurality of prioritized parameters to dynamically reduce signal bandwidth while preserving perceptual quality of the signals.”

Applicant’s claim 33 contains the limitations of “[a] method comprising: receiving a plurality of signals in a compressed format through a transmission medium at variable frame rates based on a plurality of prioritized parameters to dynamically reduce signal bandwidth while preserving perceptual quality of the plurality of the signals; decoding the plurality of compressed signals; and transmitting the decoded signals to a receiving device.”

In other words, Applicant's claimed invention relates to Apparatus, methods and processes using a dynamic variable bandwidth technique for compressing and decompressing digitized audio signals. Applicant's claimed invention dynamically adjusts the amount of bandwidth required for transmission by selecting a number and quantization level of transmitted parameters. Thus, Applicant's invention can dynamically adjust to an available bandwidth on a transmission media.

Zinser discloses a code book technique for tracking and reproducing pitch and voice decisions using an encoder and a decoder subsystem. The invention disclosed by Zinser incorporates a process for dealing with pitch harmonics outside the normal framing range of linear prediction coding (LPC) voice encoders. Zinser does not teach, disclose or suggest compressing or decompressing a plurality of signals at variable frame rates based on a plurality of prioritized parameters to dynamically reduce signal bandwidth while preserving perceptual signal quality.

Therefore, since Zinser does not disclose, teach or suggest all of Applicant's amended claims 1, 9, 14, 20, 26 and 33 respective limitations, Applicant respectfully asserts that amended claims 1, 9, 14, 20, 26 and 33 are not anticipated by Zinser under PCT Article 33(2). Additionally, the claims that depend directly or indirectly on claims 1, 9, 14, 20, 26 and 33, namely claims 2-3 and 8, 10-11 and 13, 15-16 and 19, 21-22 and 24-25, 27-28 and 30 -32, and 34-35 and 37-39, respectively, are also not anticipated by Zinser for the above same reason.

Accordingly, withdrawal of the PCT Article 33(2) lack of novelty assertion for claims 1-3, 9-11, 13-16, 19-22, 24-28, 30-35 and 37-39 is respectfully requested.

II. PCT Article 33(3)

It is asserted in the Written Opinion that claims 1-39 lack inventive step under PCT Article 33(3) as being obvious over Zinser in view of U.S. Patent No. 5,809,459 issued to Begstrom et al. ("Begstrom"). Applicant respectfully disagrees.

As asserted above, Applicant has amended claims 1, 9, 14, 20, 26 and 33 to contain the limitations relating to compressing or decompressing "...a plurality of signals at variable frame rates based on a plurality of prioritized parameters to dynamically reduce signal bandwidth while preserving perceptual signal quality."

As discussed above in section I, Zinser does not teach, disclose or suggest the limitations disclosed in Applicant's amended claims 1, 9, 16, 20, 26 and 33.

Begstrom discloses a method for extracting and tracking pitch using orthogonal error waveforms. Begstrom does not teach, disclose or suggest control of the number and quantization level of transmitted parameters.

Since neither Zinser, Begstrom, nor the combination disclose, teach or suggest the limitations contained in Applicant's amended claims 1, 9, 14, 20, 26 and 33, as listed above, there would not be any motivation to arrive at Applicant's claimed invention since neither Zinser, Begstrom, nor the combination of the two, teach, disclose or suggest the above limitations. Thus, Applicant's amended claims 1, 9, 14, 20, 26 and 33 do not lack inventive step over Zinser in view of Begstrom. Additionally, the claims that directly or indirectly depend from Applicant's amended claims 1, 9, 14, 20, 26 and 33, namely claims 2-8, 10-13, 15-19, 21-25, 27-32, and 34-39, respectively, also do not lack inventive step over Zinser in view of Begstrom for the above same reason.

Accordingly, withdrawal of the PCT Article 33(3) lack of inventive step assertion for claims 1-39 is respectfully requested.

CONCLUSION

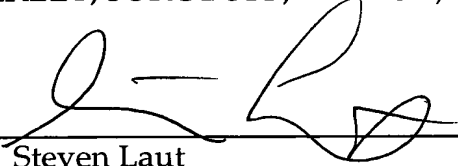
In view of the foregoing, it is believed that all claims now pending, namely Claims 1-43, patentably define the subject invention over the prior art of record and are in condition for allowance and such action is earnestly solicited at the earliest possible date.

If necessary, the Commissioner is hereby authorized in this, concurrent and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§ 1.445 or 1.446, particularly extension of time fees.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR, & ZAFMAN

Dated: December 31, 2002

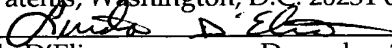


Steven Laut
Reg. No. 47,736

12400 Wilshire Boulevard
Seventh Floor
Los Angeles, California 90025
(310) 207-3800

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Linda D'Elia December 31, 2002

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Attachment: Replacement Pages

CLAIMS

1. An apparatus comprising:
an epoch locator coupled to a frame assembly,
a primary epoch analyzer coupled to the epoch locator, and
a secondary epoch analyzer coupled to the primary epoch locator,
wherein the encoder compresses a plurality of signals at variable frame rates
based on a plurality of prioritized parameters to dynamically reduce signal
bandwidth while preserving perceptual signal quality.
2. The apparatus of claim 1, wherein a transmission rate of the plurality of
compressed signals is dynamically set.
3. The apparatus of claim 1, wherein the plurality of compressed signals are
speech signals.
4. The apparatus of claim 1, wherein the encoder comprises:
an epoch locator unit;
a first epoch analyzer;
a second epoch analyzer; and
a frame assembler unit.
5. The apparatus of claim 4, wherein the plurality of compressed signals in
one of half frames and full frames.
6. The apparatus of claim 4, further including a network traffic manager
coupled to the encoder.
7. The apparatus of claim 6, wherein the network manager is one of co-
resident with the encoder and remotely located relative to the encoder.
8. The apparatus of claim 1, wherein a priority level of each of the plurality of
prioritized parameters is based on quality of speech.
9. A decoder comprising:

a frame disassembly and parameter decoding unit coupled to an excitation generator;

a synthesizing filter coupled to the excitation generator; and

an output scaling and filtering unit coupled to the synthesizing filter,

wherein the decoder decompresses a plurality of compressed signals at variable frame rates based on a plurality of prioritized parameters to dynamically reduce signal bandwidth while preserving perceptual signal quality.

10. The apparatus of claim 9, wherein a transmission rate of the plurality of compressed signals is dynamically set.

11. The apparatus of claim 9, wherein the plurality of compressed signals are speech signals.

12. The apparatus of claim 9, wherein the decoder comprises:
a frame disassembly and parameter decoding unit;
an excitation generator;
a synthesizing filter; and
an output scaling and filtering unit.

13. The apparatus of claim 9, wherein the plurality of compressed signals decompressed by the decoder at variable rates based on the plurality of prioritized parameters improve transmission during dynamically changing bandwidth while preserving perceptual quality of the signals.

14. A program storage device readable by a machine comprising instructions that cause the machine to:
receive a plurality of signals from a first transmission device;
encode the plurality of signals in a compressed format; and
transmit the plurality of signals in a compressed format through a transmission medium at variable frame rates based on a plurality of prioritized parameters to dynamically reduce signal bandwidth while preserving perceptual quality of the signals.

15. The program storage device of claim 14, wherein a transmission rate of the plurality of compressed signals is dynamically set.
16. The program storage device of claim 14, wherein the plurality of signals in a compressed format are speech signals.
17. The program storage device of claim 14, wherein encode instructions cause the machine to:
- locate an epoch;
 - analyze a first epoch;
 - analyze a second epoch; and
 - assemble a frame.
18. The program storage device of claim 17, wherein the transmit of the plurality of compressed signals is in one of a half frame and a full frame.
19. The program storage device of claim 14, further comprising instructions that cause the machine to:
- prioritize each of the plurality of prioritized parameters based on quality of speech.
20. A program storage device readable by a machine comprising instructions that cause the machine to:
- receive the plurality of signals in a compressed format through a transmission medium at variable frame rates based on a plurality of prioritized parameters to dynamically reduce signal bandwidth while preserving perceptual quality of the signals;
 - decode the plurality of compressed signals; and
 - transmit the decoded signals to a first receiving device.
21. The program storage device of claim 20, wherein a transmission rate of the plurality of compressed signals is dynamically set.

22. The program storage device of claim 20, wherein the plurality of signals in a compressed format are speech signals.

23. The program storage device of claim 20, wherein decode instructions cause the machine to:

- disassemble and parameter decode a frame;
- generate an excitation;
- synthesize and filter; and
- scale and filter an output.

24. The program storage device of claim 20, wherein the receipt of the plurality of compressed signals at variable rates based on the plurality of prioritized parameters improves signal transmission during dynamically changing bandwidth of the transmission medium while preserving perceptual quality of the signals.

25. The program storage device of claim 20, further comprising instructions that cause the machine to:

- prioritize each of the plurality of prioritized parameters based on quality of speech.

26. A method comprising:

- receiving a plurality of signals from a transmission device;
- encoding the plurality of signals in a compressed format; and
- transmitting the plurality of signals in a compressed format through a transmission medium at variable frame rates based on a plurality of prioritized parameters to dynamically reduce signal bandwidth while preserving perceptual quality of the signals.

27. The method of claim 26, wherein the variable transmission rate of the plurality of compressed signals is dynamically set.

28. The method of claim 26, wherein the plurality of signals in a compressed format are speech signals.

29. The method of claim 26, wherein encoding comprises:
locating an epoch;
analyzing a first epoch;
analyzing a second epoch; and
assembling a frame.
30. The method of claim 26, wherein the transmitting of the plurality of compressed signals is in one of a half frame and a full frame.
31. The method of claim 26, further comprising:
establishing a priority level of each of the plurality of prioritized parameters based on quality of speech.
32. The method of claim 26, wherein the transmitting of the plurality of compressed signals at variable rates based on the plurality of prioritized parameters improves signal transmission during dynamically changing bandwidth of the transmission medium while preserving perceptual quality of the signals.
33. A method comprising:
receiving a plurality of signals in a compressed format through a transmission medium at variable frame rates based on a plurality of prioritized parameters to dynamically reduce signal bandwidth while preserving perceptual quality of the plurality of the signals;
decoding the plurality of compressed signals; and
transmitting the decoded signals to a receiving device.
34. The method of claim 33, wherein the variable transmission rate of the plurality of compressed signals is dynamically set.
35. The method of claim 33, wherein the plurality of signals in a compressed format are speech signals.

36. The method of claim 33, wherein decoding comprises:
disassembling and parameter decoding a frame;
generating an excitation;
synthesizing and filtering; and
scaling and filtering an output.
37. The method of claim 33, wherein the receiving the plurality of compressed signals at variable rates based on the plurality of prioritized parameters improves signal transmission during dynamically changing bandwidth of the transmission medium while preserving perceptual quality of the signals.
38. The method of claim 33, wherein the receiving of the plurality of compressed signals is in one of a half frame and a full frame.
39. The method of claim 33, wherein receiving comprises:
prioritizing each of the plurality of prioritized parameters based on quality of speech.
40. An apparatus comprising:
means for encoding a plurality of input signals at variable frame rates, the means for encoding including:
means for identifying input signal segments;
means for extracting a plurality of parameters describing signal segments; and
means for associating priority values to the plurality of parameters.
41. The apparatus of claim 40, wherein the means for encoding comprises compressing the plurality of input signals at variable frame rates based on the plurality of prioritized parameters to dynamically reduce signal bandwidth while preserving perceptual signal quality.

42. An apparatus comprising:

means for decoding a plurality of compressed signals;

the decoding means including:

means for reconstructing parameters from the plurality of compressed signals;

means for constructing an excitation signal;

means for producing a raw output signal; and

means for producing a final output signal.

43. The apparatus of claim 42, wherein the means for decoding comprises decompressing the plurality of compressed signals at variable frame rates based on a plurality of prioritized parameters to dynamically reduce signal bandwidth while preserving perceptual signal quality.